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Bulletin No. 74

Department of Botany and Zoology

Two Insect Pests of the Elm

By A. L. Melander

1906

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Two Insect Pests of The Elm.

By A. L. Melander.

I- THE ELM BARK-LOUSE. (Gossyparia ulmi.)

It is only twenty years ago that there was introduced into the United States an European insect pest of the elm. This pest, which can be termed the elm bark-louse, gradually spread from its original place of introduction in New York to many parts of the country. Since its advent in Spokane a few years ago it has multiplied so rapidly as now to be a serious menace to the propagation of shade trees in that city.

The elm bark-louse passes the winter in a partly grown condition on the under side of the branches of the elm. At this stage the pest appears as dirty masses of cast skins in the midst of which the partly grown individuals are living. The insect can be found abundantly in crevices of the bark and especially at the crotches of the branches, but always along the under side.

The entire winter is thus passed in a dormant condition, the insects living mostly on the larger branches. With the advent of warm weather during the first days of spring, the half grown lice awaken and begin to move about.

The females cast their shell while the males spin elliptical cocoons. These cocoons are grayish white and are very conspicuous during April and May, along the under side of the smaller branches. At this time females are secreting a gray-white waxy covering over their bodies. This secretion is especially abundant along their sides so as to appear in conspicuous contrast to their dirty bodies, and to the blackened branches of the elm.

In early May the males leave their cocoons to impregnate the females. The males have two wings, which enable them to fly. The females are permanently wingless, and can be spread from tree to tree only by accidental means. Birds doubtless are the important carriers of the pest. A month after impregnation the young commence to be

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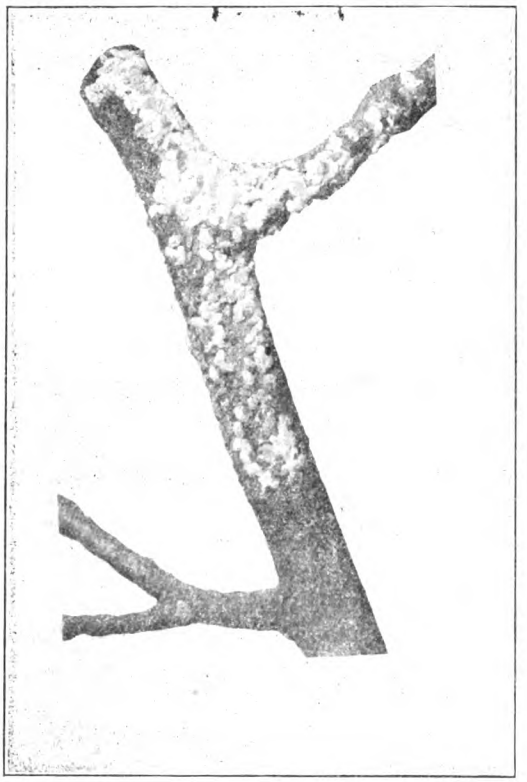
born. The young lice wander out and settle on the twigs and even on the leaves.

During the summer the bark-lice secrete a vast amount of honey dew. As this falls over the branches and the lower parts of the tree it becomes blackened and when abundant may even have an unpleasant



Twig of the Elm showing male cocoons and half grown females, enlarged nearly twice.

odor. Sidewalks under infested elms are blackened and are a source of discomfort to passers-by. Ants, flies and other insects are attracted to the honey dew and augment the nuisance.

Toward the end of summer the younger bark-lice leave the smaller twigs and leaves and migrate to their hibernation quarters along the branches.

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TREATMENT.

Strangely enough this insect, although unprotected by a scale, seems to be extremely hardy. Trials in various parts of the United States have shown that even strong insecticides have had but little effect on the pest. During the early spring of 1905 over one hundred trees in Spokane were treated under the direction of the State Experiment Station. The ordinary sulphur-lime wash was used. At the time of spraying, the males had already begun to cocoon.

An inspection of the treated trees a month later showed that the males within their cocoons were mostly unhurt. However, living females were rare. Inspection at the end of the season showed very little trace of the pest on treated trees. Unsprayed neighboring elms were still badly infested. Although these sprayings were undertaken rather late in the season, and this accounts for the escape of the males, it demonstrated that the sulphur-lime wash is an efficient agent in controlling the pest. Obviously, the escape of the males in this case was of little moment, in as much as the females were destroyed.

Accordingly it is the recommendation of the Experiment Station to give infested trees a thorough spraying with the lime-sulphur wash during February or March. This wash must be given before the leaf-buds burst or the foliage may be endangered.

II THE ELM LEAF-LOUSE. (Schizoneura americana.)

On some bright day in October the air will seem filled with myriads of tiny, woolly, blue-black insects, slowly flying to the elms and alders. Gradually they alight and start an upward procession, crawling up the trunk. By evening the trunk of the tree will be covered with insects. Another day and none will be seen, but the ground at the base is covered with their spent bodies.

This host of plant lice fly to the elms to give birth to tiny yellowish young, which are the only sexual generation of the year. The yellow lice crawl into cracks of the bark where each lays a single egg. It is in this egg stage that the winter is passed.

When the trees leaf out in the spring the eggs hatch. The young plant lice crawl out on the braches and each selects a leaf. As a result of the insect's feeding the leaf becomes swollen and curled.

Within this leaf retreat the louse gives birth to many young, so

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that during early summer curled leaves will contain several dozen individuals of various ages. At this stage a disagreeable amount of sticky honey dew is secreted, which falls to the sidewalks in drops. In July winged individuals appear in the colony and soon after they fly away to some unknown plant. The remainder of the summer is spent away from the elm, until the remarkable migration of autumn recalls the pest.

Eight infested elms were sprayed experimentally at Pullman. As a result the insect was checked, but in no case was it completely exterminated. The sulphur-lime wash gave the best satisfaction. It is recommended that trees infested with the leaf-louse be sprayed during the winter with the suphur-lime wash before the buds burst in the spring. Attention should be given to the innermost crevices of the trunk and larger branches as it is in such places that the eggs are most apt to withstand the rigors of winter. The sulphur-lime wash is a slow poison. Its effectiveness continues for many weeks after its application.

From this outline of the life history it will appear that the leaf-louse does not live over from year to year on the elm, but that trees become infested only by the autumnal migration. Should the winter spray of sulphur-lime not be given, as is sometimes unavoidable, owing to the proximity of painted buildings, it will be necessary to spray with kerosene emulsion as soon as the trees are in leaf, and before the leaves start to curl. After the leaves have curled it is impossible to reach the louse. Trees affected year after year become dwarfed and stunted, and are entirely valueless as ornamental shade trees.

HOW TO PREPARE THE SULPHUR-LIME WASH.

Sulphur, - - - - - -	1 pound
Lime, - - - - - - -	1 pound
Water, - - - - - -	3 or 4 gallons

First slake the lime in the cooking vat. When slaked add the sulphur and enough extra water so that the mixture will stir easily.

Keep it well stirred till boiling begins. After 45 minutes boiling the mixture should be completely dissolved—except for impurities in the lime—and of an amber color. Then add the requisite amount of water, and the mixture is ready to spray. It should be poured into the spraying tank through a strainer. It is advantageous to use a

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small amount of water at first so that the mixture may be more thoroughly and quickly boiled.

CAUTION.

Sulphur-lime unites chemically with copper, silver, and lead. Hence care should be used not to employ a copper vessel in making the wash. If a surface painted with a lead paint be accidentally sprayed the paint will become blackened. This blackening can be bleached by washing with hydrogen peroxide. The normal action of the weather will bleach back the color, but it may require several months. The spray pump should be washed out after use, and if it has brass working parts especial care should be taken to see that it does not corrode. Sulphur-lime will attack silver jewelry also.

HOW TO PREPARE KEROSENE EMULSION.

Kerosene, - - - - - -	2 gallons
Whale Oil Soap or 1 quart soft soap,	½ pound
Water, - - - - - -	1 gallon

Dissolve the soap in the water by boiling, and add the suds boiling hot to the kerosene, away from the fire. The mixture is then to be agitated violently, preferably by pumping it back on itself with a force pump. After four or five minutes the mixture suddenly becomes creamy in consistency. If well made, the cream will stand for a long time without free oil rising to the surface. Use 1 gallon of the emulsion to 5 gallons of water in spraying during the winter time.

Where it is impossible to use the sulphur-lime wash owing to an awkward situation of the trees to be sprayed, kerosene emulsion should be employed. It is necessary, however, to use kerosene emulsion in the strength indicated above. This spray will not discolor painted surfaces.

When trees in leaf are to be sprayed with kerosene emulsion dilute one gallon of the stock mixture with twelve gallons of water.

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